

WHAT IS CLAIMED IS:

1. A catheter comprising:

an elongated catheter body having proximal and distal ends and at least one lumen therethrough;

a three-dimensional ablation assembly at or near the distal end of the catheter body, said assembly having a framework defining a length and a circumference, the assembly movable into a collapsed configuration with a greater length and a lesser circumference and an expanded configuration with a lesser length and a greater circumference, the framework comprising a plurality of tensile members interwoven in a manner such that the length increases as the circumference decreases and vice versa;

said assembly also having a ribbon electrode extending along said circumference, said ribbon electrode adapted to move with said framework.

2. A catheter of claim 1, wherein said framework of the assembly in the expanded configuration has a first circumference in a first section along its length and a different second circumference in a second section along its length.

3. A catheter of claim 1, further comprising an expander attached at or near its distal end to distal ends of the tensile members and extending through the catheter body, the expander having a proximal end that extends out the proximal end of the catheter body, and having a lumen extending therethrough, whereby, in use, the expander can be moved

longitudinally relative to the catheter body to expand and collapse the assembly.

4. A catheter of claim 1, further comprising an expander attached at or near its distal end to distal ends of the tensile members and extending through at least a distal portion of the catheter body, whereby, in use, the expander can be moved longitudinally relative to the catheter body to expand and collapse the assembly.

5. A catheter of claim 1, further comprising an expander attached at or near its distal end to proximal ends of the tensile members and extending through at least a distal portion of the catheter body, whereby, in use, the expander can be moved longitudinally relative to the catheter body to expand and collapse the assembly.

6. A catheter of claim 1, wherein the tensile members have shape-memory such that the assembly self-expands from the collapse configuration into the expanded configuration.

7. A catheter of claim 1, wherein the expander is moved proximally to actuate the assembly into the expanded configuration.

8. A catheter of claim 5, wherein the expander is moved proximally to withdraw the assembly into a distal portion of the catheter body.

9. A catheter of claim 8, wherein the assembly assumes the collapsed configuration while withdrawn in the distal portion of the catheter body.

10. A catheter of claim 6, wherein the expander is moved distally such that the assembly self-deploys into the expanded configuration when past the distal end of the catheter body.

11. The catheter of claim 3, wherein the expander comprises plastic tubing.

12. The catheter of claim 3, wherein the expander comprises braided plastic tubing.

13. The catheter of claim 3, wherein the expander has a proximal end attached to a control handle.

14. The catheter of claim 13, wherein the control handle comprises:

a handle housing having proximal end distal ends, and a piston having a proximal end mounted in the distal end of the handle housing and a distal end fixedly attached to the proximal end of the catheter body;

wherein the proximal end of the expander is fixedly attached, directly or indirectly, to the handle housing so that longitudinal movement of the piston relative to the handle housing results in longitudinal movement of the expander relative to the catheter body to thereby expand and collapse the assembly.

15. The catheter of claim 14, wherein the proximal end of the expander extends outside the proximal end of the control handle and through a support tube.

16. The catheter of claim 10, wherein the support tube has a distal end that extends inside the control handle and that is fixedly attached to the handle housing.

17. The catheter of claim 3, wherein the expander is generally coaxial with the catheter body.

18. The catheter of claim 3, wherein the expander forms the axis of the assembly.

19. The catheter of claim 1, wherein the assembly comprises at least four tensile members.

20. The catheter of claim 1, wherein each tensile member comprises an internal flexible wire and a non-conductive covering over the flexible wire.

21. The catheter of claim 20, wherein the internal flexible wire of each wire comprises nitinol.

22. The catheter of claim 1, wherein the ribbon electrode is elastic.

23. The catheter of claim 1, wherein the ribbon electrode has shape memory.

24. The catheter of claim 23, wherein the ribbon electrode folds when the framework is in the collapsed configuration and unfolds when the framework is in the expanded configuration.

25. A catheter comprising:

an elongated catheter body having proximal and distal ends and at least one lumen therethrough;

a three-dimensional ablation assembly at the distal end of the catheter body, said assembly having a cylindrical structure defining a length and a circumference, the assembly adapted to assume a deployed configuration, the structure being configured with a plurality of longitudinal slats that predictably bow outwardly in the radial direction to a greater circumference when said length is decreased;

the assembly also having a ribbon electrode extending around said structure, said ribbon electrode adapted to expand from said circumference to said greater circumference with said structure.

26. A catheter of claim 25, wherein said longitudinal slats are separated by longitudinal slots.

27. A catheter of claim 25, wherein said longitudinal slats are longitudinally aligned.

28. A catheter of claim 25, further comprising an expander attached at or near its distal end to a distal end of the structure and extending through the catheter body, the expander movable longitudinally relative to the catheter body to deploy the ablation assembly by decreasing the length.

29. A catheter of claim 25, wherein the cylindrical structure is seamless.

51992/AW/W112

30. A catheter of claim 25, wherein the cylindrical structure is laser cut with said slats.